

## Program Assessment Rating Tool (PART)

**Program:** Advanced Scientific Computing Research

**Agency:** Department of Energy

**Bureau:** Office of Science

**Type(s):** Research and Development

Competitive Grant

Capital Assets and Service Acquisition

Section Scores				Overall Rating
1	2	3	4	Moderately Effective
100%	70%	67%	87%	

**1.1 Is the program purpose clear?**

Answer: YES

Question Weight: 20%

**Explanation:** The mission of the Advanced Scientific Computing Research (ASCR) program is to discover, develop, and deploy the computational and networking tools that enable researchers in the scientific disciplines to analyze, model, simulate, and predict complex phenomena important to the Department of Energy (DOE). To accomplish this mission the program fosters and supports fundamental research in advanced scientific computing applied mathematics, computer science, and networking and operates supercomputer, networking, and related facilities.

**Evidence:** FY 2004 Budget Request ([www.mbe.doe.gov/budget/04budget/index.htm](http://www.mbe.doe.gov/budget/04budget/index.htm)). Public Law 95-91 that established the Department of Energy (DOE). The ASCR Mission has been validated by the Advanced Scientific Computing Advisory Committee (ASCAC).

**1.2 Does the program address a specific and existing problem, interest or need?**

Answer: YES

Question Weight: 20%

**Explanation:** The ASCR program addresses the specific need for the Department of Energy's Office of Science (SC) to develop large-scale, complex, high-performance simulation capabilities to accelerate civilian scientific advancement focused on the mission needs of the DOE, and secondarily on the needs of the broader scientific community.

**Evidence:** This program was specifically authorized in the "High Performance Computing Act of 1991" (PL 102-194). The "Scientific Discovery through Advanced Computing (SciDAC)" plan describes the issues and the program's strategic vision circa 2000 ([www.osti.gov/scidac/SciDAC.pdf](http://www.osti.gov/scidac/SciDAC.pdf)).

**1.3 Is the program designed so that it is not redundant or duplicative of any other Federal, state, local or private effort?**

Answer: YES

Question Weight: 20%

**Explanation:** The ASCR program is unique in addressing the specific computational needs and challenges of civilian R&D in the DOE. ASCR is coordinated with other Federal programs through the Interagency Working Group on IT R&D (IWG/IT R&D) to ensure that efforts are not needlessly redundant. The most recent strategic vision for the program (SciDAC) briefly describes relationships with the computing programs at DOE's National Nuclear Security Administration and other Federal agencies.

**Evidence:** IWG/IT R&D ([www.itrd.gov/iwg/program.html](http://www.itrd.gov/iwg/program.html)). SciDAC plan (see above).

**1.4 Is the program design free of major flaws that would limit the program's effectiveness or efficiency?**

Answer: YES

Question Weight: 20%

**Explanation:** The ASCR program is based on competitive merit-review, independent expert advice, and joint program planning. This proves efficient and effective. However, a Committee of Visitors (COV) has yet to independently validate ASCR's merit review process.

**Evidence:** ASCAC reports ([www.sc.doe.gov/ascr/adviscommittee.html](http://www.sc.doe.gov/ascr/adviscommittee.html)). Joint planning efforts include SciDAC, Genomes to Life ([doegenomestolife.org](http://doegenomestolife.org)), and computational nanoscience ([www.sc.doe.gov/production/bes/besac/Theory%20and%20Modeling%20in%20Nanoscience.pdf](http://www.sc.doe.gov/production/bes/besac/Theory%20and%20Modeling%20in%20Nanoscience.pdf)). Program reviews and files.

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**1.5 Is the program effectively targeted, so that resources will reach intended beneficiaries and/or otherwise address the program's purpose directly?**

Answer: YES

Question Weight: 20%

**Explanation:** ASCAC ensure that research community input is regularly gathered to assess the priorities and progress of the program. SciDAC efforts are tightly linked to the application programs (and associated advisory committees). Peer review is used to assess the relevance and quality of each project.

**Evidence:** ASCAC reviews and reports. SciDAC reports ([www.osti.gov/scidac](http://www.osti.gov/scidac)). Program files.

**2.1 Does the program have a limited number of specific long-term performance measures that focus on outcomes and meaningfully reflect the purpose of the program?**

Answer: YES

Question Weight: 10%

**Explanation:** While not comprehensive, the two long-term measures reflect key goals for the underlying mathematics and computer science research sponsored by ASCR, and provide a test case for the computation component of the Genomes to Life SciDAC effort. The program has defined "successful" and "minimally effective" performance milestones for each measure, and an external panel will assess interim program performance on a triennial basis, and update the measures as necessary. It is inappropriate for a basic research program such as this one to have a quantitative long-term efficiency measure.

**Evidence:** SciDAC goals are outlined in program plan ([www.osti.gov/scidac](http://www.osti.gov/scidac)), and GTL-specific goals are online at [doegenomestolife.org](http://doegenomestolife.org). A description of the "successful" and "minimally effective" milestones, and an explanation of the relevance of these measures to the field can be found on the SC Web site ([www.sc.doe.gov/measures](http://www.sc.doe.gov/measures)).

**2.2 Does the program have ambitious targets and timeframes for its long-term measures?**

Answer: YES

Question Weight: 10%

**Explanation:** ASCAC has reviewed the new long-term measures for this program and found them to be ambitious and meaningful indicators of progress toward computer science, applied mathematics, and SciDAC goals.

**Evidence:** Letter from ASCAC chair regarding review of long-term measures.

**2.3 Does the program have a limited number of specific annual performance measures that can demonstrate progress toward achieving the program's long-term goals?**

Answer: YES

Question Weight: 10%

**Explanation:** ASCR has developed quantitative annual output measures that are indicators of progress toward the long term measures, primarily because they focus on efficiently providing the computational capabilities (hardware and the underlying applied math and computer science) necessary for enabling improved scientific progress.

**Evidence:** FY04 Budget Request. Description on measures and relationship to long-term goals ([www.sc.doe.gov/measures](http://www.sc.doe.gov/measures)). Brief description of "best value" procurement process alluded to in the procurement measure ([www.nersc.gov/research/annrep01/03systems.html#NERSC4](http://www.nersc.gov/research/annrep01/03systems.html#NERSC4)).

**2.4 Does the program have baselines and ambitious targets for its annual measures?**

Answer: YES

Question Weight: 10%

**Explanation:** All of the annual measures include quantifiable annual targets. The new efficiency measure quantifies ambitious performance improvements over current rates. Baseline data (FY02 and FY03) for the procurement and NERSC usage measures demonstrate the targets to be ambitious, yet realistic.

**Evidence:** FY04 Budget Request. Description on measures and relationship to long-term goals ([www.sc.doe.gov/measures](http://www.sc.doe.gov/measures)). NERSC FY02 Annual Report ([www.nersc.gov/research/annrep02/html/](http://www.nersc.gov/research/annrep02/html/)).

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**2.5 Do all partners (including grantees, sub-grantees, contractors, cost-sharing partners, and other government partners) commit to and work toward the annual and/or long-term goals of the program?**

Answer: NO

Question Weight: 10%

**Explanation:** ASCR program solicitations for research grants do not yet explicitly include specific program goals, though Federal program managers attempt to fund a grant portfolio that is aimed at the long-term goals of the program. For contractors, a limited FY03 audit by the DOE Inspector General (IG) found that "performance expectations generally flowed down into the scope of work at the national laboratories." Management and Operations (M&O) contracts for the labs contain generic "scientific quality" performance-based evaluation provisions.

**Evidence:** Most recent general renewal solicitation ([www.science.doe.gov/grants/Fr03-02.html](http://www.science.doe.gov/grants/Fr03-02.html)). Memo from the DOE IG to the Director of the Office of Science. M&O contract performance evaluation provisions (WWW-accessible examples include: Oak Ridge National Lab, [www.ornl.gov/Contract/UT-BattelleContract.htm](http://www.ornl.gov/Contract/UT-BattelleContract.htm); and, Lawrence Berkeley National Lab, [www.lbl.gov/LBL-Documents/Contract-98/AppFTOC.html](http://www.lbl.gov/LBL-Documents/Contract-98/AppFTOC.html)).

**2.6 Are independent evaluations of sufficient scope and quality conducted on a regular basis or as needed to support program improvements and evaluate effectiveness and relevance to the problem, interest, or need?**

Answer: NO

Question Weight: 10%

**Explanation:** ASCAC has conducted a fairly light review of the program's facilities to gauge relevance and quality, but there have not been similar portfolio-level peer reviews of the research program by an independent panel. The program does not yet have COV evaluations of any program elements, but expects to receive the first COV report by April 2004.

**Evidence:** ASCAC facilities review report ([www.krellinst.org/esinfo/ASCAC-facilities-final.mhw.doc](http://www.krellinst.org/esinfo/ASCAC-facilities-final.mhw.doc)).

**2.7 Are Budget requests explicitly tied to accomplishment of the annual and long-term performance goals, and are the resource needs presented in a complete and transparent manner in the program's budget?**

Answer: NO

Question Weight: 10%

**Explanation:** DOE has not yet provided a budget request that adequately integrates performance information.

**Evidence:**

**2.8 Has the program taken meaningful steps to correct its strategic planning deficiencies?**

Answer: YES

Question Weight: 10%

**Explanation:** In addition to active participation in a current interagency roadmapping task force on high end computing, ASCR has held a series of strategic planning workshops, participated in the drafting of a new Office of Science strategic plan, and new performance goals and targets have been developed in coordination with OMB. A new COV process is being organized, with the first program element review expected back by April 2004. However, the activity level of ASCAC is below that of other Office of Science advisory committees.

**Evidence:** Interagency task force ([www.itrd.gov/hecrtf-outreach/index.html](http://www.itrd.gov/hecrtf-outreach/index.html)). Networking workshop ([www.hep.anl.gov/may/ScienceNetworkingWorkshop](http://www.hep.anl.gov/may/ScienceNetworkingWorkshop)). Science applications workshop ([www.pnl.gov/scales](http://www.pnl.gov/scales)). Program files, including COV charge letter to ASCAC chair. ASCAC report activity ([www.sc.doe.gov/ascr/ascac\\_reports.htm](http://www.sc.doe.gov/ascr/ascac_reports.htm)).

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<b>2.CA1</b>	<b>Has the agency/program conducted a recent, meaningful, credible analysis of alternatives that includes trade-offs between cost, schedule, risk, and performance goals and used the results to guide the resulting activity?</b>	Answer: YES	Question Weight: 10%
Explanation:	One of a kind research facilities are not amenable to the same type of alternatives analysis as other capital asset investments. Nevertheless, the Exhibit 300s provided to OMB contain roughly equivalent analyses, which typically compare the attributes of various computer vendors systems--using appropriate "best value" metrics--before making a procurement decision.		
Evidence:	Brief description of "best value" procurement for program's production facility, National Energy Research Scientific Computing Center (NERSC, <a href="http://www.nersc.gov/research/annrep01/03systems.html#NERSC4">www.nersc.gov/research/annrep01/03systems.html#NERSC4</a> ).		
<b>2.RD1</b>	<b>If applicable, does the program assess and compare the potential benefits of efforts within the program to other efforts that have similar goals?</b>	Answer: NA	Question Weight: 0%
Explanation:	This is a basic R&D program, and the question is intended for industry-related R&D programs.		
Evidence:			
<b>2.RD2</b>	<b>Does the program use a prioritization process to guide budget requests and funding decisions?</b>	Answer: YES	Question Weight: 10%
Explanation:	Although not visible outside DOE, internal SC budget formulation practices include a priority ranking process. ASCR is currently drafting a strategic plan--with the input of external community workshops--as a part of the overall SC planning process. ASCR has engaged the advisory process for the computing components of other SC programs. However, the program has not yet fully engaged ASCAC in its prioritization process, and it is not always obvious that program level budget execution decisions are made within a prioritization framework.		
Evidence:	ASCAC reports ( <a href="http://www.sc.doe.gov/ascr/adviscommittee.html">www.sc.doe.gov/ascr/adviscommittee.html</a> ; topical computing centers report not on Web site). Engagement with other SC programs advisory processes include: Genomes to Life ( <a href="http://doegenomestolife.org">doegenomestolife.org</a> ) and computational nanoscience ( <a href="http://www.sc.doe.gov/production/bes/besac/Theory%20and%20Modeling%20in%20Nanoscience.pdf">www.sc.doe.gov/production/bes/besac/Theory%20and%20Modeling%20in%20Nanoscience.pdf</a> ).		
<b>3.1</b>	<b>Does the agency regularly collect timely and credible performance information, including information from key program partners, and use it to manage the program and improve performance?</b>	Answer: NO	Question Weight: 8%
Explanation:	Facility user surveys and benchmarking provide operational performance information. The program collects performance data from individual grantees and national labs, and uses peer review as a type of standardized quality control at the individual grant level. However, there is not yet a systematic process, such as regular COV evaluations, that conducts research portfolio quality and process validations. While DOE IG contracts with an outside auditor to check internal controls for performance reporting, and the IG periodically conducts limited reviews of performance measurement in SC, it is not clear that these audits check the credibility of performance data reported by DOE contractors.		
Evidence:	Facility user surveys and user groups/committees ( <a href="http://hpcf.nersc.gov/about">hpcf.nersc.gov/about</a> , <a href="http://www.es.net">www.es.net</a> , <a href="http://www.ccs.ornl.gov/CHUG.html">www.ccs.ornl.gov/CHUG.html</a> ). Program files, including peer review of the facilities.Reporting requirements for grants ( <a href="http://www.science.doe.gov/production/grants/605-19.html">www.science.doe.gov/production/grants/605-19.html</a> ).		

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**3.2 Are Federal managers and program partners (including grantees, sub-grantees, contractors, cost-sharing partners, and other government partners) held accountable for cost, schedule and performance results?**

Answer: YES

Question Weight: 8%

**Explanation:** Senior Executive Service (SES) and Program Manager Performance Plans are directly linked to program goals. The Management and Operations (M&O) contracts for the Labs and User Facilities include performance measures linked to program goals. Research funding requirements ensure consideration of past performance.

**Evidence:** Program and personnel files. For performance-based fee adjustments on M&O contracts, see evidence for question 2.5. Grant rules for renewals ([www.science.doe.gov/grants/#GrantRules](http://www.science.doe.gov/grants/#GrantRules)).

**3.3 Are funds (Federal and partners') obligated in a timely manner and spent for the intended purpose?**

Answer: YES

Question Weight: 8%

**Explanation:** Using DOE's monthly accounting reports, SC personnel monitor progress toward obligating funds consistent with an annual plan that is prepared at the beginning of the fiscal year to ensure alignment with appropriated purposes. SC programs consistently obligate more than 99.5% of available funds.

**Evidence:** Program files. DOE-wide audit reports.

**3.4 Does the program have procedures (e.g. competitive sourcing/cost comparisons, IT improvements, appropriate incentives) to measure and achieve efficiencies and cost effectiveness in program execution?**

Answer: YES

Question Weight: 8%

**Explanation:** SC is currently undergoing a reengineering exercise aimed at flattening organizational structure and improving program effectiveness. The program will collect data necessary to track their "efficiency" measure. The system performance measures used by NERSC ensures maximum return on procurement investments.

**Evidence:** SC reengineering information ([www.screstruct.doe.gov](http://www.screstruct.doe.gov)). See "Measures" tab for the programmatic efficiency measure. NERSC system performance measures ([www.nersc.gov/aboutnersc/presentations/Sc99/SC99Kramer6/SC99Kramer6.PPT](http://www.nersc.gov/aboutnersc/presentations/Sc99/SC99Kramer6/SC99Kramer6.PPT), and [hpcf.nersc.gov/about/ERSUG/meeting\\_info/May03/May03\\_Presentations/Wong/NERSC\\_Perf\\_Eval\\_Activities.ppt](http://hpcf.nersc.gov/about/ERSUG/meeting_info/May03/May03_Presentations/Wong/NERSC_Perf_Eval_Activities.ppt)).

**3.5 Does the program collaborate and coordinate effectively with related programs?**

Answer: YES

Question Weight: 8%

**Explanation:** The ASCR program is involved in numerous formal and informal collaborations with other programs in advanced scientific computing research, though primarily with national security agencies as opposed to other civilian science agencies. ASCR is a leading agency in the ongoing governmental Interagency Working Group on IT R&D of the National Science and Technology Council, including co-chairing a current task force on high end computing.

**Evidence:** Summary of joint activities with other agencies ([www.sc.doe.gov/ascr/hitchcock.ppt](http://www.sc.doe.gov/ascr/hitchcock.ppt)). Interagency Working Group on IT R&D ([www.itrd.gov/iwg](http://www.itrd.gov/iwg)).

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**3.6 Does the program use strong financial management practices?**

Answer: YES

Question Weight: 8%

**Explanation:** SC staff execute the ASCR program consistent with established DOE budget and accounting policies and practices. These policies have been reviewed by external groups and modified as required to reflect the latest government standards.

**Evidence:** Various Departmental manuals. Program files. Audit reports.

**3.7 Has the program taken meaningful steps to address its management deficiencies?**

Answer: YES

Question Weight: 8%

**Explanation:** SC is currently reengineering to improve program management efficiency. A new COV process is being organized by ASCR, with the first program element review expected back by April 2004.

**Evidence:** SC reengineering information ([www.screstruct.doe.gov](http://www.screstruct.doe.gov)). COV charge letter to ASCAC chair, including scope, conflict of interest issues, and future schedule.

**3.CA1 Is the program managed by maintaining clearly defined deliverables, capability/performance characteristics, and appropriate, credible cost and schedule goals?**

Answer: YES

Question Weight: 8%

**Explanation:** Procurement contracts with computer vendors tie payments to specific deliverables, including the sustained system performance measured over the lifetime of the contract.

**Evidence:** Exhibit 300s submitted to OMB. Program files, including competitive performance proposals from vendors.

**3.CO1 Are grants awarded based on a clear competitive process that includes a qualified assessment of merit?**

Answer: NO

Question Weight: 8%

**Explanation:** First time grant applications are encouraged in all Request For Proposals. ASCR has a specific solicitation for a new Early Career Principal Investigator (ECPI) program, and investments in minority institutions under the HBCU/MI program. However, the award and merit review process has not yet been validated by a COV.

**Evidence:** There were 26 new and 9 renewed ASCR grantees in FY2002. In addition, there were 70 new and 9 renewed grantees in FY2001 (includes new programs for SciDAC & Microbial Cell). ECPI website ([www.sc.doe.gov/production/grants/Fr02-16.html](http://www.sc.doe.gov/production/grants/Fr02-16.html)).

**3.CO2 Does the program have oversight practices that provide sufficient knowledge of grantee activities?**

Answer: YES

Question Weight: 8%

**Explanation:** In addition to grantee progress reports, program managers stay in contact with grantees through email and telephone, and conduct program reviews and site visits.

**Evidence:** Reporting requirements for grants ([www.science.doe.gov/production/grants/605-19.html](http://www.science.doe.gov/production/grants/605-19.html)). Program files, including documentation of program manager site visits, etc.

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<b>3.CO3</b>	<b>Does the program collect grantee performance data on an annual basis and make it available to the public in a transparent and meaningful manner?</b>	Answer: NO	Question Weight: 8%
Explanation:	In accordance with DOE Order 241.1A, the final and annual technical reports of program grantees are made publicly available on the web through the Office of Scientific and Technical Information's "Information Bridge". However, program-level aggregate data on the impact of the grants program is not adequately communicated in the annual DOE Performance and Accountability report.		
Evidence:	DOE Order 241.1A. Information Bridge ( <a href="http://www.osti.gov/bridge/">www.osti.gov/bridge/</a> ). FY02 Performance and Accountability Report ( <a href="http://www.mbe.doe.gov/stratmgt/doe02rpt.pdf">www.mbe.doe.gov/stratmgt/doe02rpt.pdf</a> ).		
<b>3.RD1</b>	<b>For R&amp;D programs other than competitive grants programs, does the program allocate funds and use management processes that maintain program quality?</b>	Answer: NO	Question Weight: 8%
Explanation:	ASCAC facility reviews, facility steering committees, and user surveys validate the quality of the scientific user facilities. Unsolicited field work proposals from the Federal Labs are merit reviewed, but not competed. The funds for research programs and scientific user facilities at the Federal Labs are allocated through a limited competition analogous process to the unlimited process outlined in 10 CFR 605. However, the quality of the research funded via this process has not yet been validated by a COV.		
Evidence:	ASCAC facility report ( <a href="http://www.krellinst.org/esinfo/ASCAC-facilities-final.mhw.doc">www.krellinst.org/esinfo/ASCAC-facilities-final.mhw.doc</a> ). Unsolicited proposals (See 10CFR600.6, <a href="http://professionals.pr.doe.gov/ma5/MA-5Web.nsf/FinancialAssistance/Part+600">professionals.pr.doe.gov/ma5/MA-5Web.nsf/FinancialAssistance/Part+600</a> ). Example of lab solicitation, with field work proposal reference ( <a href="http://www.science.doe.gov/grants/LAB03_17.html">www.science.doe.gov/grants/LAB03_17.html</a> ). Merit Review procedures ( <a href="http://www.sc.doe.gov/production/grants/merit.html">www.sc.doe.gov/production/grants/merit.html</a> ). 10 CFR 605 ( <a href="http://www.science.doe.gov/production/grants/605index.html">www.science.doe.gov/production/grants/605index.html</a> ). Facility user surveys and user groups/committees ( <a href="http://hpcf.nersc.gov/about">hpcf.nersc.gov/about</a> , <a href="http://www.es.net">www.es.net</a> , <a href="http://www.ccs.ornl.gov/CHUG.html">www.ccs.ornl.gov/CHUG.html</a> ). Program files, including peer review of the facilities.		
<b>4.1</b>	<b>Has the program demonstrated adequate progress in achieving its long-term performance goals?</b>	Answer: LARGE EXTENT	Question Weight: 20%
Explanation:	ASCAC will evaluate progress toward the new long term performance measures every three years, but no external portfolio-level reviews are available other than the generally positive facilities report by ASCAC. Early results indicate that the SciDAC effort appears to be successful, which is important for achieving the future goals of the program.		
Evidence:	ASCAC facilities review report ( <a href="http://www.krellinst.org/esinfo/ASCAC-facilities-final.mhw.doc">www.krellinst.org/esinfo/ASCAC-facilities-final.mhw.doc</a> ). SciDAC update at latest ASCAC meeting ( <a href="http://www.sc.doe.gov/ascr/Laub031403.ppt">www.sc.doe.gov/ascr/Laub031403.ppt</a> ).		
<b>4.2</b>	<b>Does the program (including program partners) achieve its annual performance goals?</b>	Answer: YES	Question Weight: 20%
Explanation:	Although the three annual performance goals for FY05 are new, ASCR has met the targets for most of its former annual measures.		
Evidence:	FY02 Performance and Accountability Report ( <a href="http://www.mbe.doe.gov/stratmgt/doe02rpt.pdf">www.mbe.doe.gov/stratmgt/doe02rpt.pdf</a> ). FY04 Annual Performance Plan ( <a href="http://www.mbe.doe.gov/budget/04budget/content/perfplan/perfplan.pdf">www.mbe.doe.gov/budget/04budget/content/perfplan/perfplan.pdf</a> ).		

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**4.3 Does the program demonstrate improved efficiencies or cost effectiveness in achieving program goals each year?**

Answer: YES

Question Weight: 20%

**Explanation:** The sustained system performance metric used by NERSC for procurements has resulted in machines with more compute nodes delivered by the vendor than originally planned, which in turn allows more scientific simulations to be carried out.

**Evidence:** Program files, including procurement contracts.

**4.4 Does the performance of this program compare favorably to other programs, including government, private, etc., with similar purpose and goals?**

Answer: NA

Question Weight: 0%

**Explanation:** While user surveys regularly show a fairly high level of satisfaction with ASCR facilities, expert comparative analyses of the program as a whole have not been done. The program has a unique role to serve the needs of the other five SC research programs, and the DOE mission more broadly, so the value of such analyses is questionable at best given the interconnectedness of the U.S. computing community.

**Evidence:** NERSC Annual User Survey ([hpcf.nersc.gov/about/survey/](http://hpcf.nersc.gov/about/survey/)).

**4.5 Do independent evaluations of sufficient scope and quality indicate that the program is effective and achieving results?**

Answer: LARGE  
EXTENT

Question Weight: 20%

**Explanation:** The ASCR facilities are effective in achieving desired results, based on assessment by the ASCAC in their facilities report, and based on external peer review of both NERSC and ESnet. However, no independent review process has been carried out to assess the program's research portfolio.

**Evidence:** ASCAC facilities review report ([www.krellinst.org/esinfo/ASCAC-facilities-final.mhw.doc](http://www.krellinst.org/esinfo/ASCAC-facilities-final.mhw.doc)). Program files, including ESnet and NERSC peer review results.

**4.CA1 Were program goals achieved within budgeted costs and established schedules?**

Answer: YES

Question Weight: 20%

**Explanation:** Performance data for FY02 and FY03 demonstrate that the capital asset procurements, primarily for NERSC acquisitions, were almost exactly on schedule and on budget. This excellent performance can be primarily attributed to the sustained system performance metric used for these procurements, which focuses on the actual performance of the resource available to the end users rather than on the theoretical performance of a proposed system.

**Evidence:** Exhibit 300s submitted to OMB. FY02 Performance and Accountability Report ([www.mbe.doe.gov/stratmgt/doe02rpt.pdf](http://www.mbe.doe.gov/stratmgt/doe02rpt.pdf)). Brief description of "best value" procurement for NERSC ([www.nersc.gov/research/annrep01/03systems.html#NERSC4](http://www.nersc.gov/research/annrep01/03systems.html#NERSC4)).

## PART Performance Measurements

**Program:** Advanced Scientific Computing Research  
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**Measure:** Progress toward developing the mathematics, algorithms, and software that enable scientifically-critical models of complex systems, including highly nonlinear or uncertain phenomena, or processes that interact on vastly different scales, or contain both discrete and continuous elements. An independent expert panel will conduct a review and rate progress (excellent, adequate, poor) on a triennial basis.

**Additional Information:** An external panel will conduct triennial reviews of progress. See [www.sc.doe.gov/measures](http://www.sc.doe.gov/measures) for more information.

<u>Year</u>	<u>Target</u>	<u>Actual</u>	<b>Measure Term:</b> Long-term
2006	Excellent		
2009	Excellent		
2012	Excellent		
2015	Excellent		

**Measure:** Progress toward developing, through the Genomes to Life partnership with the Biological and Environmental Research program, the computational science capability to model a complete microbe and a simple microbial community. An independent expert panel will conduct a review and rate progress (excellent, adequate, poor) on a triennial basis.

**Additional Information:** An external panel will conduct triennial reviews of progress. See [www.sc.doe.gov/measures](http://www.sc.doe.gov/measures) for more information.

<u>Year</u>	<u>Target</u>	<u>Actual</u>	<b>Measure Term:</b> Long-term
2006	Excellent		
2009	Excellent		
2012	Excellent		
2015	Met Goal		

**Measure:** Focus usage of the primary supercomputer at the National Energy Research Scientific Computing Center on capability computing (percentage of the computing time used that is accounted for by computations that require at least 1/8 of the total resource).

**Additional Information:** There were two primary supercomputers, in different lifecycle stages, at the Center in 2002. See [www.sc.doe.gov/measures](http://www.sc.doe.gov/measures) for more information.

<u>Year</u>	<u>Target</u>	<u>Actual</u>	<b>Measure Term:</b> Annual
2002		75%, 22%	

## PART Performance Measurements

**Program:** Advanced Scientific Computing Research

**Agency:** Department of Energy

**Bureau:** Office of Science

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**Measure:** Focus usage of the primary supercomputer at the National Energy Research Scientific Computing Center on capability computing (percentage of the computing time used that is accounted for by computations that require at least 1/8 of the total resource).

**Additional Information:** There were two primary supercomputers, in different lifecycle stages, at the Center in 2002. See [www.sc.doe.gov/measures](http://www.sc.doe.gov/measures) for more information.

<u>Year</u>	<u>Target</u>	<u>Actual</u>	<b>Measure Term:</b> Annual
2003		36%	
2004	50%		
2005	50%		

**Measure:** Maintain Procurement Cost/Performance Baselines. Percentages within: (1) original baseline cost for completed procurements of major computer systems or network services; and, (2) original performance baseline versus integrated performance over the life of the contract(s).

**Additional Information:** See [www.sc.doe.gov/measures](http://www.sc.doe.gov/measures) for more information.

<u>Year</u>	<u>Target</u>	<u>Actual</u>	<b>Measure Term:</b> Annual
2002	<10%, <10%	0%, 0%	
2003	<10%, <10%	0%, -1%	
2004	<10%, <10%		
2005	<10%, <10%		

**Measure:** Improve Computational Science Capabilities. Average annual percentage increase in the computational effectiveness (either by simulating the same problem in less time or simulating a larger problem in the same time) of a subset of the application codes within the Scientific Discovery through Advanced Computing effort.

**Additional Information:** Initial baseline set against 2002. See [www.sc.doe.gov/measures](http://www.sc.doe.gov/measures) for more information, including the declaration of the subset of application codes.

<u>Year</u>	<u>Target</u>	<u>Actual</u>	<b>Measure Term:</b> Annual (Efficiency Measure)
2003	10%	3181%	
2004	50%		
2005	50%		